

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

Revised 9/20/02

RCRA Corrective Action

Environmental Indicator (EI) RCRA Info code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: _____ Vickers Incorporated _____
Facility Address: _____ 6600 North 72nd Street _____
Facility EPA ID #: _____ NED007286198 _____

DETERMINATION RESULT: YES

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

If yes - check here and continue with #2 below.

If no - re-evaluate existing data, or

if data are not available, skip to #8 and enter "IN" (more information needed) status code.

URS, 2001. Focused RCRA Facility Investigation and Corrective Measures Study, Final Report Volume 1 of 2, Vickers, Inc. Omaha, Nebraska, September.

URS, 2001. Focused RCRA Facility Investigation and Corrective Measures Study, Final Report Volume 2 of 2, Vickers, Inc. Omaha, Nebraska, September.

URS, 2003, Installation of Additional Monitoring Wells, Vickers, Inc., Omaha, NE. March 3.

Unisys, 1997, Interim Remedial Measures Startup Report, Vickers Incorporated, Omaha, Nebraska. March.

Unisys, 2004, Third Quarter 2004 Groundwater Monitoring Report, Vickers, Incorporated, Omaha, Nebraska,, October 29, 2004.

Haley & Aldrich, Inc., 2005. Revised Workplan For Interim Measures Associated with Site Redevelopment Former Vickers, Inc. Site, January 2005.

Unisys, 2004, Fourth Quarter 2004 Groundwater Monitoring Report, Vickers, Incorporated, Omaha, Nebraska, January 31, 2005.

Haley & Aldrich, Inc., 2005, Final Change Pages to the Revised Wrokplan For Interim Measures Associated with Site Redevelopment, February 9, 2005.

Unisys, 2005, First Quarter 2005 Groundwater Monitoring Report, Vickers, Incorporated, Omaha, Nebraska, June 1, 2005

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future. —

Definition of “Migration of Contaminated Groundwater Under Control” EI

A positive “Migration of Contaminated Groundwater Under Control” EI determination (“YE” status code) indicates that the migration of “contaminated” groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original “area of contaminated groundwater” (for all groundwater “contamination” subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRAs). The “Migration of Contaminated Groundwater Under Control” EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRA Info national database ONLY as long as they remain true (i.e., RCRA Info status codes must be changed when the regulatory authorities become aware of contrary information).

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRA Info code (CA750)**

Page 3

2. Is **groundwater** known or reasonably suspected to be “**contaminated**”¹ above appropriately protective “levels” (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria [e.g., Maximum Contaminant Levels (MCLs), the maximum permissible level of a contaminant in water delivered to any user of a public water system under the Safe Drinking Water Act]) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

X If yes - continue after identifying key contaminants, citing appropriate “levels,” and referencing supporting documentation.

If no - skip to #8 and enter “YE” status code, after citing appropriate “levels,” and referencing supporting documentation to demonstrate that groundwater is not “contaminated.”

If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s): Quarterly groundwater sampling both on and offsite show that groundwater is contaminated with chlorinated solvents and their degradation products above MCL’s. Analytical data from the latest quarterly monitoring report (1st Quarter 2005) documents the presence of 1,1,1-Trichloroethane (1,1,1-TCA), 1,1-Dichloroethylene (1,1-DCE) and Trichloroethylene (TCE) at levels above appropriately protective levels. Table 1, attached, presents the contaminants detected and the highest concentration detected both on and offsite during the last quarterly (1st Quarter 2005) sampling event.

Groundwater in the vicinity of the site is not used as a drinking water source. Drinking water is supplied by the City of Omaha’s Municipal Utilities District (MUD). The Omaha MUD gets it’s water supply from two different sources, one is the Missouri River and the second is a municipal well field in southern Sarpy County near the town of La Platte, NE. The municipal well field is located several miles southeast of the site and the contaminated groundwater plume at the site is moving in a northwest direction. Due to the direction of groundwater flow and the distance to the municipal well field, the municipal well field is not considered at risk to contamination from the site.

According to well registration records at the Nebraska Natural Resources Commission there are two private wells located in the NW1/4 of Section 35, Township 16N, Range 12E, approximately 4000 feet west-northwest of the site. One well is registered as a domestic well and the other is registered as an irrigation well. Both wells are located at least 2000 feet west of the know extent of the groundwater plume.

¹“Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate “levels” (appropriate for the protection of the groundwater resource and its beneficial uses).

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRA Info code (CA750)**
Page 4

Footnotes:

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRA Info code (CA750)**

Page 5

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within “existing area of contaminated groundwater”² as defined by the monitoring locations designated at the time of this determination)?

___X___ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the “existing area of groundwater contamination”²).

_____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the “existing area of groundwater contamination”²) - skip to #8 and enter “NO” status code, after providing an explanation.

_____ If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s): Monitoring wells installed as part of the RCRA Facility Investigation (RFI) report have delineated the extent of groundwater contamination. The attached figures delineate the extent of groundwater contamination of 1,1,1-TCA, 1,1-DCE and TCE during the 1st Quarter 2005 groundwater monitoring event. Monitoring wells MW-31 and MW-32 were installed in July of 2004 and are located downgradient of the known contaminant plume. No site related compounds have been detected in these wells for three successive quarterly monitoring periods (Unisys 3rd, 4th Quarter 2004, 1st Quarter 2005). The groundwater plume is considered to be stable.

Figure 4, Approximate Extent of Dissolved Phase TCA First Quarter 2005

Figure 5, Approximate Extent of Dissolved Phase DCE First Quarter 2005

Figure 6, Approximate Extent of Dissolved phase TCE First Quarter 2005

² “existing area of contaminated groundwater” is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of “contamination” that can and will be sampled/tested in the future to physically verify that all “contaminated” groundwater remains within this area, and that the further migration of “contaminated” groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRA Info code (CA750)**

Page 6

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

_____ If yes - continue after identifying potentially affected surface water bodies.

X If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): There are no surface water bodies within the site property boundaries. The site is situated along a ridge top that forms a drainage divide between the Cole Creek and Little Papillion Creek basins. Surface runoff from the south and east parts of the site drain to tributaries of Cole Creek. Cole Creek is itself a tributary of Little Papillion Creek. Surface runoff from the north and west parts of the site drain to a tributary of little Papillion Creek which is approximately 3000 feet from the source of contamination at the site. The source of groundwater contamination was due to a subsurface release therefore surface runoff from the site is not impacted by site contaminants. A groundwater plume is present at the site and has migrated toward little Papillion Creek however groundwater data indicate that the plume has not reached the creek. Monitoring wells are in place between the known extent of the plume and little Papillion Creek.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRA Info code (CA750)**

5. Is the **discharge** of “contaminated” groundwater into surface water likely to be “**insignificant**” (i.e., the maximum concentration³ of each contaminant discharging into surface water is less than 10 times their appropriate groundwater “level,” and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

_____ If yes - skip to #7 (and enter “YE” status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration³ of key contaminants discharged above their groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_____ If no - (the discharge of “contaminated” ground water into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration³ of each contaminant discharged above its groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations³ greater than 100 times their appropriate groundwater “levels,” the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter “IN” status code in #8.

Rationale and Reference(s): _____

³ As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRA Info code (CA750)**

6. Can the **discharge** of “contaminated” groundwater into surface water be shown to be “**currently acceptable**” (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented⁴)?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site’s surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment⁵, appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment “levels,” as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of “contaminated” groundwater can not be shown to be “**currently acceptable**”) - skip to #8 and enter “NO” status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter “IN” status code.

Rationale and Reference(s): _____

⁴ Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

⁵The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRA Info code (CA750)**

Page 9

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

___**X**___ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

_____ If no - enter "NO" status code in #8.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s): As part of the consent agreement between the property owner and the US EPA Vickers is required to conduct quarterly groundwater monitoring at the site. Currently quarterly groundwater sampling is completed at the following monitoring wells: MW-03, MW-04D, MW-05, MW-06, MW-07, MW-08, MW-09, MW-10, MW-10D, MW-11, MW-12, MW-13, MW-15, MW-16, MW-17D, MW-17S, MW-18D, MW-18S, MW-19, MW-20, MW-21, MW-22, MW-23, MW-24, MW-25D, MW-25S, MW-26D, MW-26S, MW-27D, MW-27S, MW-28, MW-29, MW-30, MW-31 and MW-32. Quarterly samples are also collected from the following extraction wells: EW-01, EW-02, EW-03, EW-04, EW-07, EW-08, EW-09, EW-11 and EW-12. Current plans call for the redevelopment of the property into a shopping center. Redevelopment will result in the regrading of the property and the abandonment and replacement of some monitoring wells. Redevelopment will also result in the redesign of the current groundwater extraction system which is located along the western boundary of the facility. Groundwater monitoring will continue during site redevelopment, however the groundwater monitoring scheme will need to be revised pending final decisions regarding monitoring well abandonment and replacement.

Interim Remedial Measures (IRM) have been implemented at the site to address source remediation and to hydraulically control the groundwater plume at the property boundary.

Operation of an IRM soil vapor and groundwater extraction and treatment system for source remediation began on January 15, 1996. This system incorporates air sparging, groundwater pump-and-treat, and soil vapor extraction (SVE) technologies. This system is composed of five wells (EW-1, EW-2, EW-3, EW-4 and EW-5) located near the former liquid waste collection tanks (source), which remove both groundwater and soil vapor. These wells became operational in January 1996 and continue to operate to date. Through June 2001, the source control system has removed an estimated 26,000 pounds of VOCs. Quarterly sampling is conducted on this system to monitor performance. Redevelopment of the facility will result in the removal of the source area remediation system. Redevelopment will also result in the removal of approximately the upper 15 - 20 feet of soil in the source zone and the removal of the abandoned tanks in the source zone. The specifics regarding rationale and handling of potentially contaminated soils during redevelopment can be found in the Revised Workplan for Interim Measures Associated with Site Redevelopment (January 2005) and the Final Change Pages to the Revised Workplan for Interim Measures Associated with Site Redevelopment (February 2005).

Operation of an IRM groundwater hydraulic gradient control system at the property boundary began in October 1996. The system is composed of four wells (EW-8, EW-9, EW-11, and EW-12), located at the western property boundary these wells remove groundwater only. EW-8 became operational in October 1996. EW-9 through EW-12 were placed on-line in October 1998. The hydraulic control system continues to operate to date. Sampling of these wells is part of the quarterly monitoring along with monitoring groundwater levels. Redevelopment of the facility will result in modifications to the groundwater hydraulic

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRA Info code (CA750)**

Page 10

gradient control system. Modifications will result in the expansion of this system from four wells to twelve wells along the western property boundary but no lapse in operation will occur during expansion. In addition the redesigned system will have the flexibility to be expanded if necessary.

Figure 2, Well Location Plan First Quarter 2005

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRA Info code (CA750)**

Page 11

8. Check the appropriate RCRA Info status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the **Vickers Omaha facility , EPA ID # NED007286198** , located at 6600 North 72nd Street. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

NO - Unacceptable migration of contaminated groundwater is observed or expected.

IN - More information is needed to make a determination.

Completed by (signature) Original Signed by Date 6/13/05
Robert E. Aston
Project Manager

Supervisor (signature) Original Signed by Date 6/13/05
Donald Toensing
Acting RCAP Branch Manager
EPA Region VII

Locations where References may be found:

EPA Region VII Records Center
Abrahams Branch Library
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